

CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A method for synchronizing data on a device in communication with a client system, said method comprising the steps of:
 - (a) mapping a device in communication with a client system via a USB connection into a user session hosted by a server, said user session including an executing instance of an application, said server in communication with said client system using a presentation-level protocol; and
 - (b) synchronizing a collection of data on said device in communication with the client system with a collection of data accessible from said user session as a result of the execution of said application instance.
2. The method of claim 1 wherein said device in communication with the client system uses a WI-FI communication protocol.

3. The method of claim 1 wherein said device in communication with the client system uses an IR serial communication protocol.
4. The method of claim 1 wherein said device in communication with the client system uses a Bluetooth serial communication protocol.
5. The method of claim 1 wherein said device in communication with the client system communicates using a wireless USB/ultra-wideband wireless communication protocol .
6. The method of claim 1 wherein said application instance uses socket communication for inter-process communications and step (b) further comprises the step of:
(b-1) hooking a socket call within the session.
7. The method of claim 6 wherein said hooking is virtual loop-back address hooking.
8. The method of claim 6 wherein said hooking is virtual IP address hooking.

9. The method of claim 1 wherein said application uses socket communication for inter-process communications and step (b) further comprises the step of:
(b-1) hooking a socket call on the server console.
10. The method of claim 1, comprising the further step of:
binding, at the client system, an identifier of a virtual communication channel to a mapping request prior to mapping the device to a user session.
11. The method of claim 1 wherein the client system is a proxy client.
12. The method of claim 11 wherein the proxy client is hosted on the same server supporting the user session.
13. The method of claim 11 wherein the proxy client is hosted on a different server than the server supporting the user session.
14. A method for synchronizing data on a device in communication with a client system, said client system in communication with a server using a presentation-level protocol, said method comprising the steps of:

a) determining the identity of a device in communication with said client system;

b) determining that the device is a member of a registered device class;

creating a notification indicating that the device is in communication with the client system;

directing the notification to an instance of an application executing within a user session hosted by a server and

e) synchronizing a collection of data on said device in communication with the client system with a collection of data accessible from said user session as a result of the execution of said application instance.

15. The method of claim 14 wherein the device is in communication with the client system via one of a USB communication protocol and wireless USB/ultra-wideband wireless communication protocol.
16. The method of claim 14 wherein the device is in communication with the client system via an IR serial communication protocol.

17. The method of claim 14 wherein the device is in communication with the client system via a Bluetooth serial communication protocol.
18. The method of claim 14 wherein said application instance uses socket communication for inter-process communications and step (e) further comprises the step of:
(e-1) hooking a socket call within the session.
19. A system for synchronizing data on a device in communication with a client system, comprising:
a client system executing a presentation-level protocol to communicate with a server system, said client system including an event manager to generate event notifications based on a communication received from the device interfaced with said client system;
a device in communication with said client system, said device in communication with the client system including a collection of data;
a server system executing a presentation-level protocol to communicate with said client system and host at least one user session on said server system, said user session

executing an instance of an application used to synchronize the collection of data on said device in communication with the client system with a collection of data accessible from said user session.

20. The system of claim 19 wherein said event manager is a Plug and Play event manager and said event notification is a Plug and Play event notification.
21. The system of claim 19 wherein said application instance uses socket communication for inter-process communications and the synchronizing of the collection of data on the client-attached device and the collection of data accessible from the server session hooks a socket call made by the application instance.
22. The system of claim 21 wherein the socket call is hooked within the user session.
23. The system of claim 21 wherein the socket call is hooked using virtual IP address hooking.
24. The system of claim 21 wherein the socket call is hooked using virtual loop-back address hooking.

25. An article of manufacture having embodied thereon computer-readable program means for synchronizing data on devices communicating with a client system with data accessible from a server , comprising:
computer-readable program means for mapping a device in communication with a client system via a USB connection into a user session hosted by a server, said server in communication with said client using a presentation-level protocol; and
computer-readable program means for synchronizing a collection of data on said device in communication with the client system with a collection of data accessible to said session as a result of the execution of said application instance.
26. The article of manufacture of claim 25 wherein said device is in communication with the client system using a wireless USB/ultra-wideband wireless communication protocol.
27. The article of manufacture of claim 25 wherein said device is in communication with the client system using an IR serial communication protocol.

28. The article of manufacture of claim 25 wherein said device is in communication with the client system via a Bluetooth serial communication protocol.
29. The article of manufacture of claim 25 wherein said application instance uses socket communication for inter-process communications and the computer-readable program means for synchronizing a collection of data on said device in communication with the client system further comprises:
computer-readable program means for hooking a socket call within the session.
30. The article of manufacture of claim 29 wherein said hooking is virtual loop-back address hooking.
31. The article of manufacture of claim 28 wherein said hooking is virtual IP address hooking.
32. The article of manufacture of claim 25 wherein said application instance uses socket communication for inter-process communications and the computer-readable program means for synchronizing a collection of data on

said device in communication with the client system further comprises:

computer-readable program means for hooking a socket call on the server console.

33. The article of manufacture of claim 25, further comprising :
computer-readable program means for binding, at the client system, an identifier of a virtual communication channel to a mapping request prior to mapping the device to a user session.

34. An article of manufacture having embodied thereon
computer-readable program means for a method for synchronizing data on a device in communication with a client system with a collection of data accessible from a server, comprising:
computer-readable program means for determining the identity of a device in communication with the client system via a USB connection, said client system communicating with a server using a presentation-level protocol;
computer-readable program means for determining that the device is a member of a registered device class;

computer-readable program means for creating a notification indicating that the device is in communication with the client;

computer-readable program means for directing the notification to an instance of an application executing within a user session hosted by a server; and

computer-readable program means for synchronizing a collection of data on said device in communication with the client system with a collection of data accessible to said server as a result of the execution of said application instance.

35. The article of manufacture of claim 34 wherein the device is in communication with the client system using a wireless USB/ultra-wideband wireless communication protocol.
36. The article of manufacture of claim 34 wherein the device is in communication with the client system via an IR serial communication protocol.
37. The article of manufacture of claim 34 wherein the device is in communication with the client system via a Bluetooth serial communication protocol.

38. The article of manufacture of claim 34 wherein said application instance uses socket communication for inter-process communications and the computer-readable program means for synchronizing a collection of data on said device in communication with the client system further comprises:
computer-readable means for hooking a socket call within the session.
39. The article of manufacture of claim 34 wherein the socket call is hooked on the server console.
40. A method for synchronizing data on a device in communication with a client system, said method comprising the steps of:
a) determining the identity of a device in communication with the client system via a USB connection;
b) determining that the device is a member of a registered device class;
creating a notification indicating that the device is in communication with the client system;
directing the notification to an application executing on a

server; and

e) synchronizing a collection of data on said device in communication with the client system with a collection of data accessible from said server as a result of the execution of said application .

41. The method of claim 40 wherein the device is in communication with the client system using an IR serial communication protocol.
42. The method of claim 40 wherein the device is in communication with the client system via a Bluetooth serial communication protocol.
43. The method of claim 40 wherein the device is in communication with the client system via a wireless USB/ultra-wideband wireless communication protocol.
44. A system for synchronizing data on a device in communication with a client system, comprising:
a client system communicating with a server system, said client system including an event manager to generate event notifications based on a communication received from the

device interfaced with said client system via a USB connection;

a device in communication with said client system, said device in communication with the client system including a collection of data;

a server system communicating with said client system and executing an application used to synchronize the collection of data on said device in communication with the client system with a collection of data accessible to said server.

45. The system of claim 44 wherein said event manager is a Plug and Play event manager and said event notification is a Plug and Play event notification.
46. A method for synchronizing data on a device in communication with a client system, said method comprising the steps of:
 - (a) providing a client system communicating with a server using a presentation-level protocol;
 - (b) intercepting at least one device enumeration method in a session hosted by the server, said enumeration method enumerating at least one device communicating with the

client;

(c) mapping said at least one device in communication with a client system into a user session hosted by the server based on the results of said enumeration method, said user session including an executing instance of an application; and

(d) synchronizing a collection of data on said device in communication with the client system with a collection of data accessible from said user session as a result of the execution of said application instance.

47. The method of claim 45 wherein said device in communication with the client system is communicating over a USB connection.
48. The method of claim 46 wherein said enumeration method is intercepted via a hook DLL